

Next generation microwave multiplexers

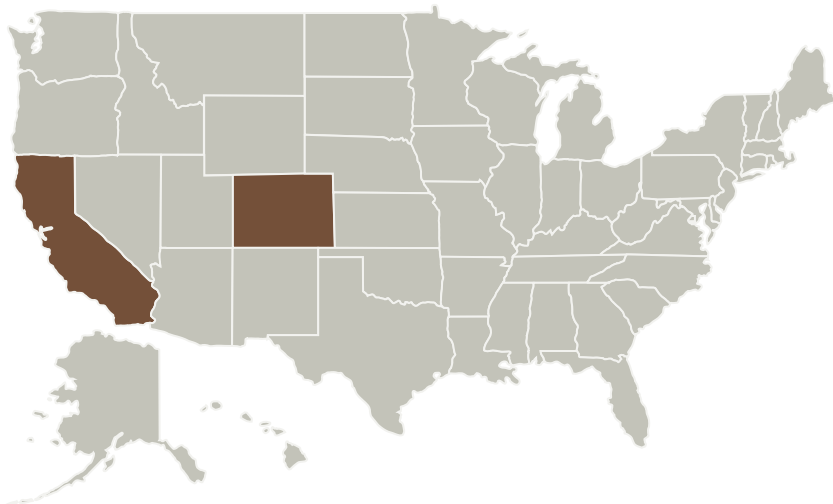
Completed Technology Project (2015 - 2018)



Project Introduction

We propose to continue our successful program for the development of breakthrough readout technology for low-temperature detectors. The next generation of larger arrays requires multiplexed readout at microwave frequencies. Multiplexing at microwave frequencies with superconducting microwave resonators shows great promise for the instrumentation of very large arrays of transition-edge sensors (TES) and microwave kinetic inductance detectors (MKID). Applications include the detection of the cosmic microwave background (CMB), submillimeter and far-infrared astronomy, optical astronomy, and x-ray astronomy. These arrays will play a critical role in answering questions about the origins and evolution of galaxies, stars, and planetary systems, the physics of the cosmos, and the physics of the inflationary epoch in the early universe. We propose an integrated program to develop quantum-limited amplifiers to enable the readout of both large TES and MKID arrays. These amplifiers include microwave SQUIDs for TES readout and wideband parametric amplifiers for MKID arrays.

Primary U.S. Work Locations and Key Partners



Primary U.S. Work Locations

California

Colorado



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Organizational Responsibility

Responsible Mission Directorate:

Science Mission Directorate (SMD)

Responsible Program:

Astrophysics Research and Analysis

Project Management

Program Director:

Michael A Garcia

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Project Management (cont.)

Program Manager:

Dominic J Benford

Principal Investigator:

Kent D Irwin

Co-Investigators:

Jiansong Gao

Gene C Hilton

Theresa Tom

Johannes Hubmayr

Technology Areas

Primary:

- TX08 Sensors and Instruments
 - └ TX08.1 Remote Sensing Instruments/Sensors
 - └ TX08.1.1 Detectors and Focal Planes

Target Destination

Outside the Solar System